Sub for

INSTRUCTIONS

for using the

Keystone

MODEL A-9

Movie Camera

16 millimeter

Keystone Camera Company, Inc.

HALLET SQUARE BOSTON 24, MASS.

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Care and Operation of the

KEYSTONE MOVIE CAMERA

16-MILLIMETER

for

Model A-9

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FOREWORD

Interesting pictures are the results of good planning and correct photography.

While it is not always possible to arrange the composition of a scene, the photographer can select a view point that will eliminate some obstacles and improve the setting.

The camera should be held vertically. Distant scenes will be improved by an object in the foreground. Sky or sea scenes should not occupy more than one third of the area. Soft shadows with detail improve the quality.

Arrange the scene then follow the instructions given in this book.

TRIAL FILM

It is recommended when using the camera for the first time that only one film be exposed and developed. After projection you will have an opportunity to study the exposure and other details of your first film, and make corrections for use on future films. If there are any questions we suggest you take your film to your dealer who will be glad to make recommendations for improvements.

Have the camera before you as you read through this book, it will be easier to understand the illustrations and descriptive material. Keep this book with you until you become thoroughly familiar with the camera, so that you may refer to it when in doubt.

You will find a strip of film inside the camera. Practice threading and watch the film as it runs through. When it is properly threaded the film will feed through freely without losing the loop.

A guarantee and registration card is enclosed with your camera. Enter your camera serial number in space provided on registration card. (This serial number appears on the camera name plate.)
Print your name and address on card and mail it today.

Keystone Camera Company, Inc.

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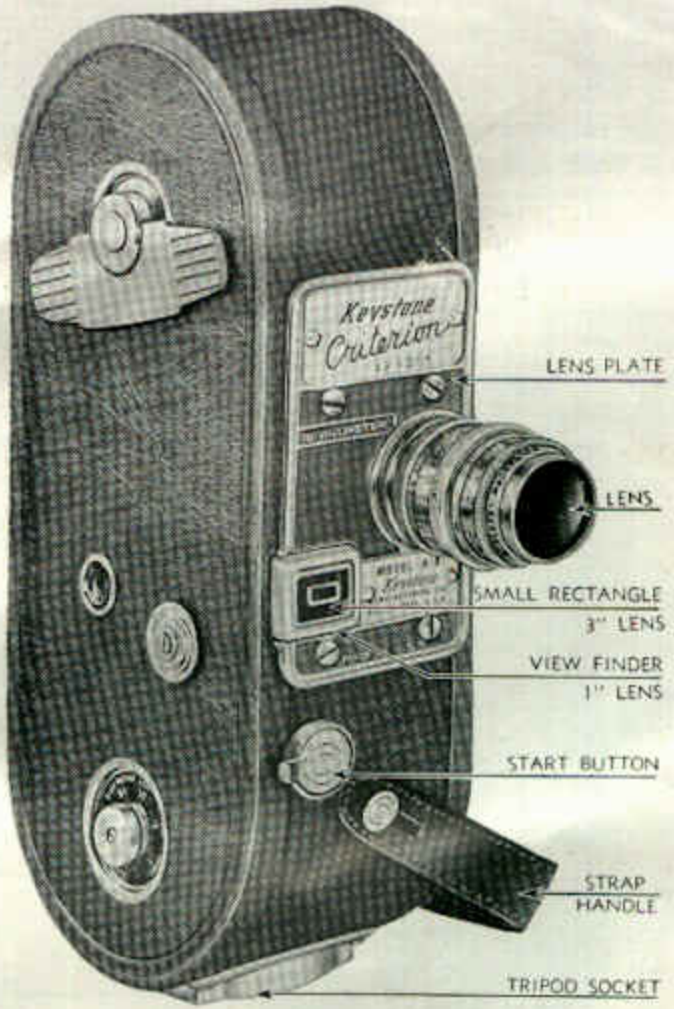


Fig. 1

Winding the Camera

Turn the wind handle clockwise until the spring motor is entirely wound. Each full winding is sufficient to run off approximately 18 feet of film, but it is better to rewind the motor after every few shots. If the motor sounds as if it were slowing down, stop it at once and rewind the spring.

Loading the Camera

Turn the lock button counter clockwise, Fig. 2, to release the lock then remove the cover. Remove the

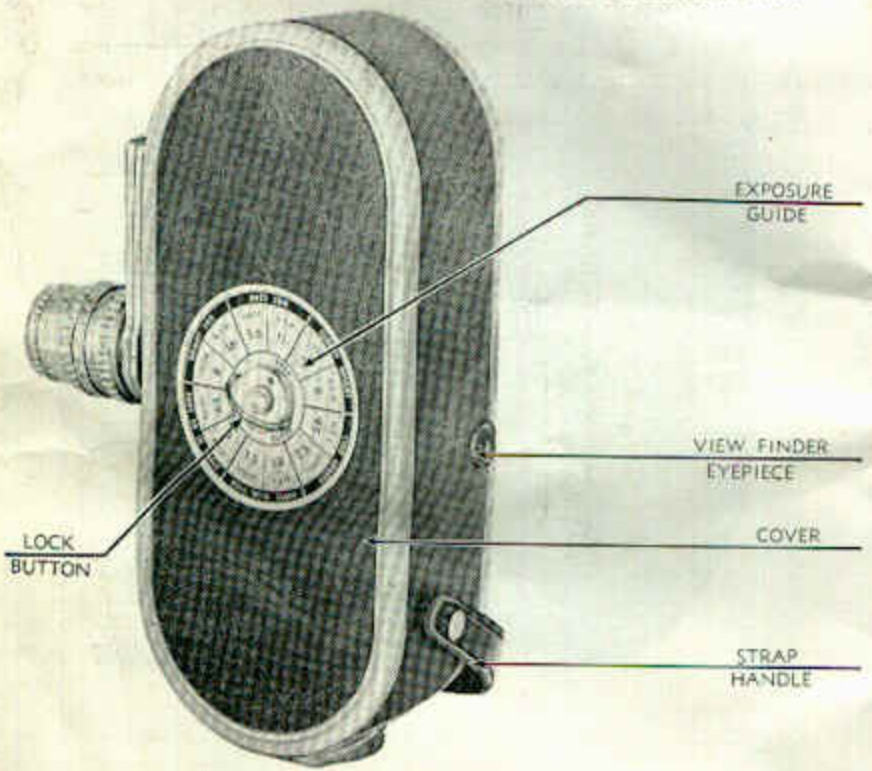


Fig. 2

film from the container in shaded light and unroll about 2 feet of film from the reel. Place the reel of film on the upper reel shaft with the round hole visible. Turn the reel around until it is seated and the end of the shaft projects slightly beyond the top plate. The film unwinds from the back of the reel.

Raise the knobs stamped "Lift" on the upper and lower sprocket guards and swing the two arms outward as shown in Fig. 3.

Thread the film in the camera following the guide lines and arrows showing on the plate. The teeth of the sprocket must enter the perforations of the film to carry it to the finger. Close the upper sprocket guard allowing the lift knob to drop down and lock the guard to the plate.

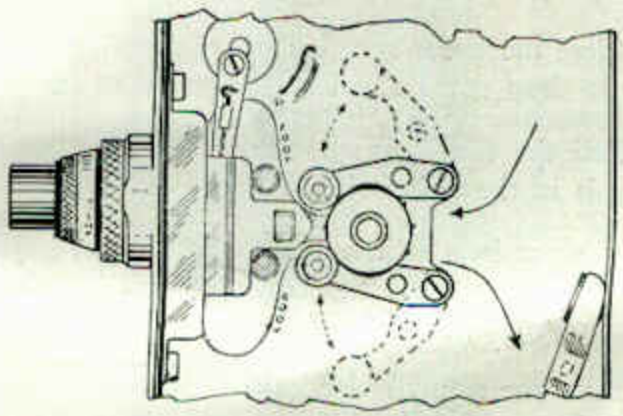


Fig. 3

Press the pressure plate Fig. 4 back and insert the film between the pressure plate and the aperture plate allowing sufficient film to form a loop indicated by the white line on the plate. This loop is necessary to supply film for the finger. Both edges of the film must be within the channel of the aperture plate and the pressure plate. Push back the footage register lever and remove take-up reel.

Form the lower loop as indicated by the white line before placing the film on the lower side of the sprocket. This loop supplies the sprocket while the finger is traveling back for more film. The teeth of the sprocket must enter the perforation of the film to prevent the take-up drawing the film through too rapidly.

Close the lower sprocket guard allowing the lift knob to drop down and lock the guard to the plate.

Pull the film loops gently to be sure that the finger is in the perforation of the film.

A short loop will cause the film to jam and a long loop may cause the emulsion on the film to be scratched.

Hold the empty reel with the round hole up and insert the end of the film in the slot of the hub, make two or three turns clockwise to secure the film on the reel.

Press the end of the footage register lever Fig. 4 forward to allow the reel to slide on the take-up shaft.

Place the empty reel on the take-up shaft and turn it slightly until the reel plate seats on the lug on the shaft and the top of the shaft projects beyond the top plate.

All take-up reels must be straight, flat and perfect in every respect to operate properly in the camera. Reels bent by dropping or otherwise damaged, or reels with plates which have been counterbored to an excessive depth and also plates with holes which do not fit the shaft properly are very liable to bind while the

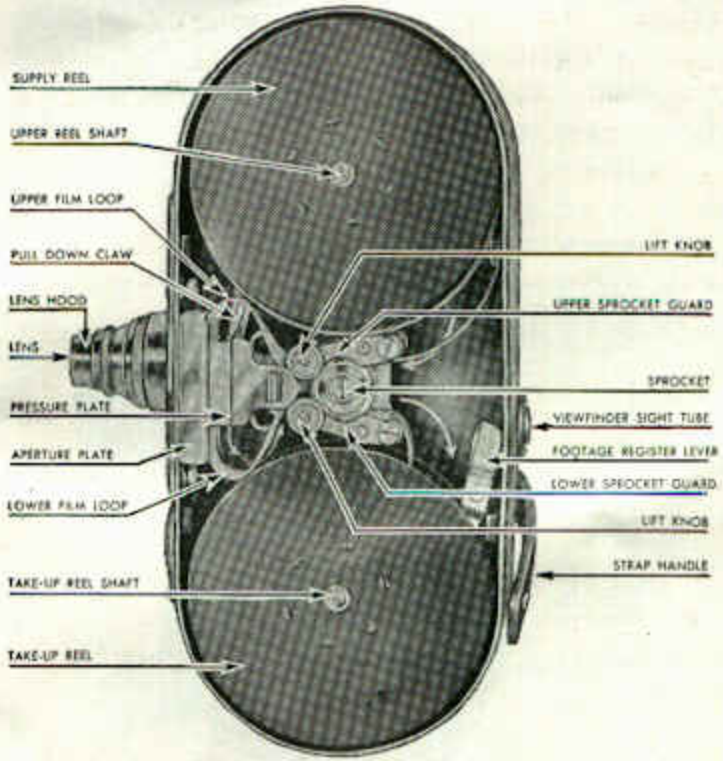
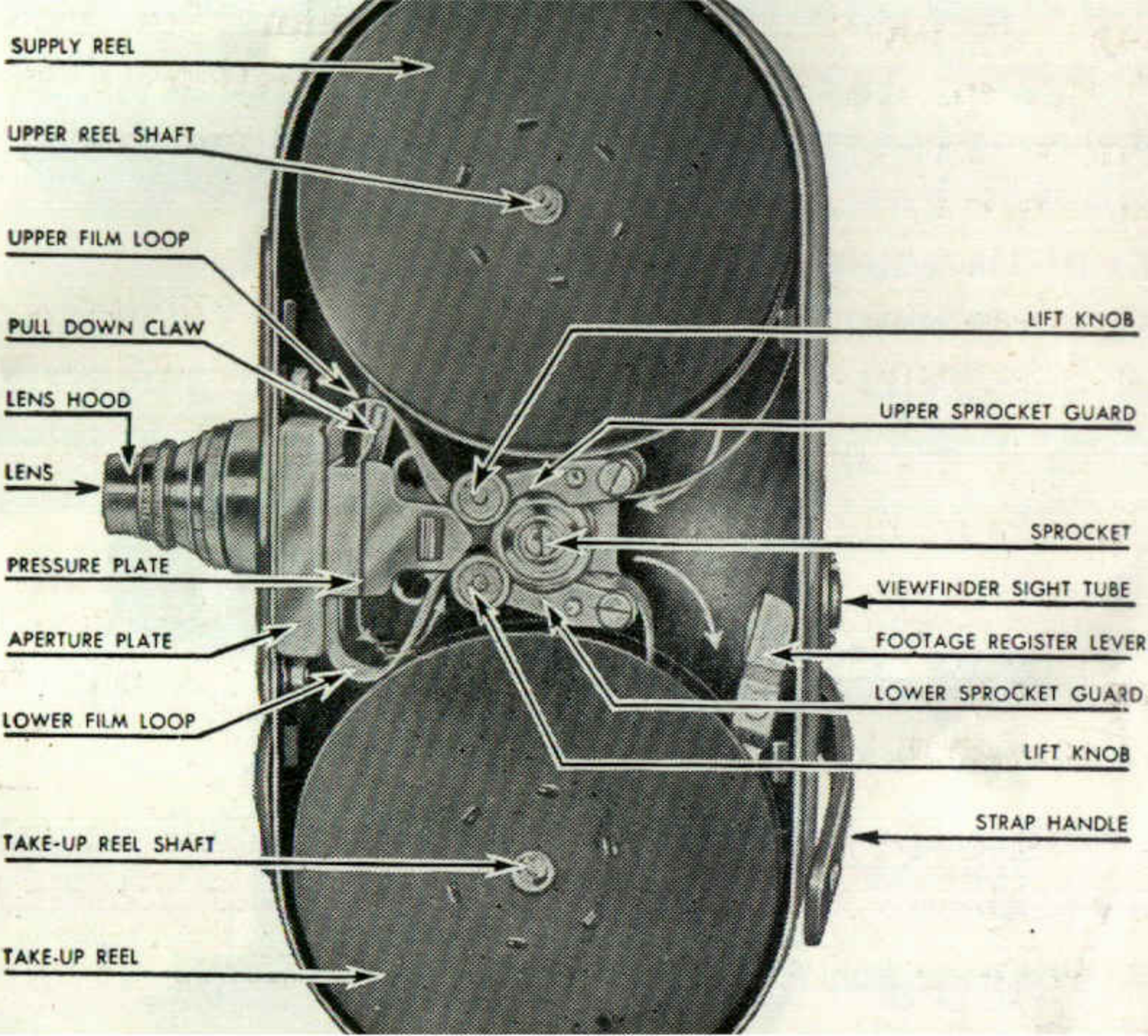


Fig. 4


SUPPLY REEL
UPPER REEL SHAFT
UPPER FILM LOOP
PULL DOWN CLAW
LENS HOOD
LENS
PRESSURE PLATE
APERTURE PLATE
LOWER FILM LOOP
TAKE-UP REEL SHAFT
TAKE-UP REEL
LIFT KNOB
UPPER SPROCKET GUARD
SPROCKET
VIEWFINDER SIGHT TUBE
FOOTAGE REGISTER LEVER
LOWER SPROCKET GUARD
LIFT KNOB
STRAP HANDLE

camera is in operation, causing the film to lose the loop or jam the camera, thus ruining the film.

If the camera is threaded correctly the film will unwind off the top reel, pass smoothly over the top of the sprocket through the film gate and back on the bottom of the sprocket and wind up on the lower reel.

Start the camera feeding six or eight inches of film through. The film should run smoothly, maintaining both loops. Replace the cover on the camera and turn the lock button clockwise. The camera is now loaded.

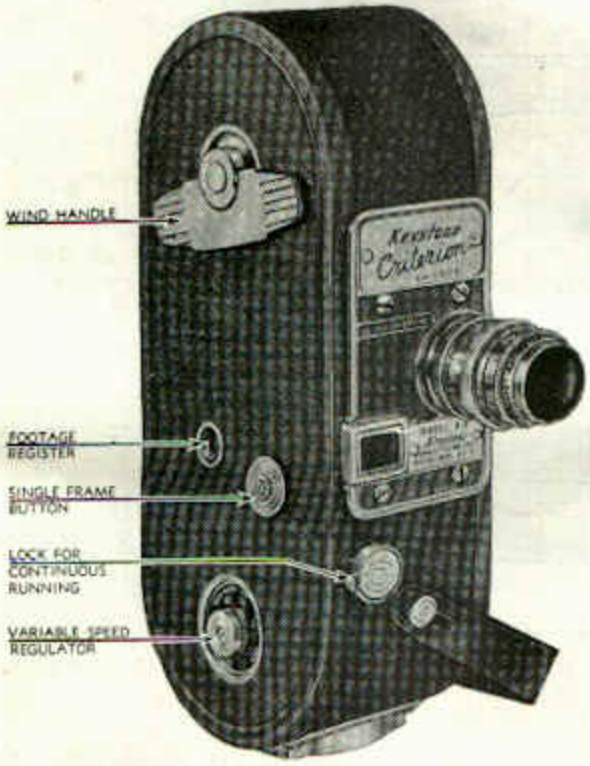
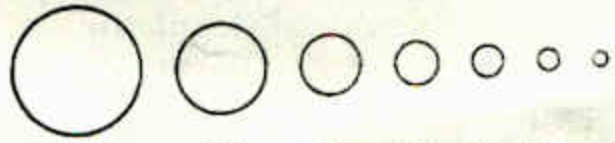


Fig. 5

Use of the Diaphragm

The proper exposure for a given camera speed depends on the size of the diaphragm opening selected. Turning the diaphragm collar on the lens, changes the amount of light admitted to the film and corrects for the prevailing light conditions. The larger the diaphragm number, the smaller the lens opening. Each succeeding number cuts the amount of light admitted to the film in half. The proper Exposure Guide (page 18) should be consulted and the diaphragm opening set to the recommended value for the prevailing light conditions. It is well to develop the habit of checking the diaphragm setting before taking each scene.

Fig. 6



By the "diaphragm opening" or "lens stop" we mean the actual size of the aperture in the diaphragm through which light may pass and reach the film.

Scenes over 50 ft. away will be sharper when f8 or smaller lens stops are used.

Focus

Cameras equipped with an F 2.5 fixed focus lens require no adjustment for distance. Pictures will be sharp providing the subject is no closer than recommended in the table below.

Diaphragm	*f*2.5	*f*2.8	*f*4	*f*5.6	*f*8	*f*11	*f*16	*f*22
Distance	8½ ft.	7½ ft.	6½ ft.	5 ft.	4 ft.	3 ft.	2½ ft.	2 ft.

When the camera is equipped with an F 1.9 focusing lens, the lens must be set for distance. Estimate the number of feet to the subject then turn the focusing ring until the number reaches the calibration line on the barrel.

When the light is sufficiently bright to use an F 5.6 opening or smaller, the distance may be set at 25 ft. and all objects beyond the distance shown in the table will be in focus.

The lens must be screwed tightly into the lens holder. A loose lens will cause the picture to be blurred or out of focus.

Variable Speed Regulator

This camera may be operated at seven different speeds:

Low speed.....10 frames per second
Normal speed.....16 frames per second
Sound speed.....24 frames per second
Slow motion.....64 frames per second
Intermediate speed.....32-40-48 frames per second

Select the speed and turn the knob around until the marker reaches the number on the dial.

Low speed: The camera operates slowly resulting in a longer exposure, therefore the lens diaphragm should be set at ½ stops smaller than would be used for normal speed. It is important that the subject be cautioned to move slowly and deliberately to prevent jerky pictures when shown on the screen.

This speed is most useful when light is poor or film is running low, also for comedy effects.

Normal speed: This is the standard camera speed for home movies, exposure guides are calibrated for this speed. It is the most economical speed which is consistent with steady, flickerless pictures when projected on the screen.

Sound speed: This is the standard speed used with sound equipment, the exposure being shorter than normal, the lens diaphragm should be opened ½ stop larger than used for normal speed.

Intermediate speeds: Open the lens diaphragm 1 to 1½ stops larger than for normal speed.

Slow motion: This speed is extremely useful in slowing down action and therefore finds its greatest value in analyzing motion. The film runs through 4 times faster than normal, reducing the exposure time ¼, therefore the lens diaphragm should be opened 2 stops larger than used for normal speed.

The camera should not run without film at high speed.

The Footage Indicator

The footage register, Fig. 5, automatically registers the number of feet of film that have been exposed. There is no adjustment of any kind necessary. When all the leader is used up the register will read zero, which means the film itself is now in the aperture and you are ready to shoot.

Audible Signal

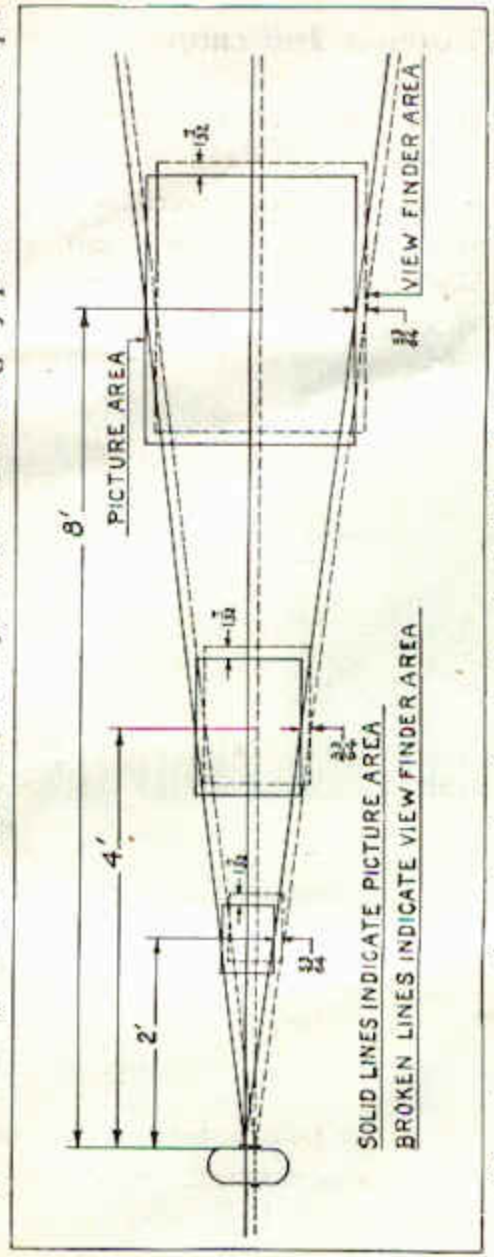
A very useful and patented feature of the Keystone camera is the audible film register with which it is equipped. Each time about one and one-half feet of film becomes used a soft signal rings and reminds the operator to shoot the proper film footage for the scene. This eliminates the necessity of stopping the camera to see how much film has been used on the scene.

Field of View

The small etched rectangle on the view finder front lens represents the size of the picture field when using a three inch Telephoto lens (see Fig. 1).

The picture will be the same as seen through the view finder, except on close-ups which require a slight correction as explained on page 13.

Diagram showing the correction required for accurate viewing of picture on close ups.



The view seen through the view finder is slightly different from the picture taken on the film due to the difference in the location of the view finder and the camera lens. This difference is shown in the above diagram.

At distances less than 10 feet the correction shown in the diagram should be made if an accurate view is required. As the distance increases, the difference becomes small when compared to the size of the field and may be disregarded.

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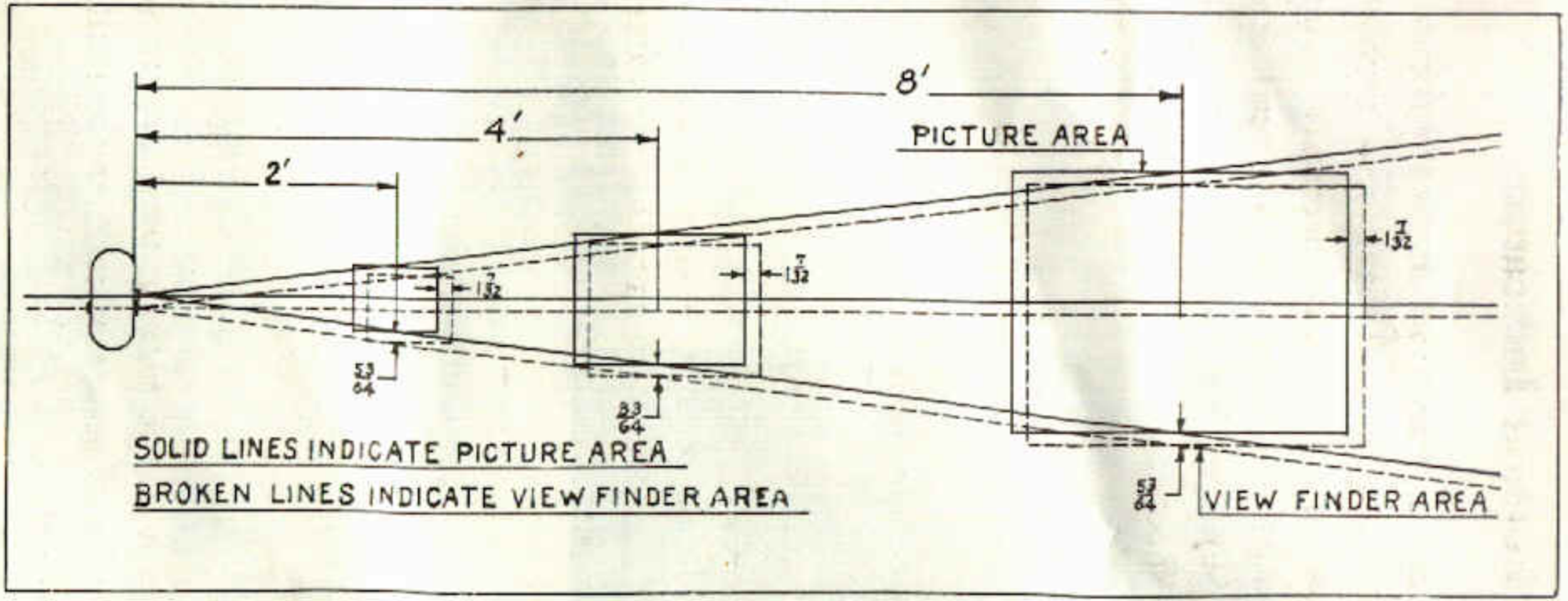

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How To Hold The Camera

The camera must be held steady to avoid jumpy pictures. We suggest the method shown in the picture.

Fig. 7

1. The strap handle around the back of the left hand with the thumb outside.
2. The right hand supporting the bottom of the case while one finger operates the start button.
3. The view finder in front of the eye.
4. The top rear of the case resting firmly against the forehead.

The hand must not obstruct the lens or viewfinder.

A tripod socket is provided on the base of the camera.

Never allow the sun to shine directly into the lens. When it is necessary to shoot against the sun, have your lens well shielded from the direct light of the sun — either by its own sunshade or the shadow of some convenient tree or other object. Expose for the shadows in this type of picture.

Operating The Camera

Remove the lens cap, set the lens, locate the scene in the viewfinder and press the start button to make the exposure. Remove the finger when the desired length of scene has been run off. Turning the start button locks the camera in running position.

A continuous running feature is used when the operator desires to get in the picture. Mount the camera on a tripod, press the start button, turn it either way until it catches in the locked position. The operator walks into the scene while the camera is running, then walks out of the field of view and stops the camera.

Single frame exposures may be made similar to a still camera by sliding the single frame button upward for each exposure. This is very useful for special effects or animation.

Unloading The Camera

When the register disc indicates that 100 feet of film has been used, continue to run the camera until the end of the film is wound on the lower spool. A few feet is provided to protect the exposed film while removing it from the camera.

Open the camera in subdued light and remove the spool of film as quickly as possible placing it in its original container.

Replace the empty reel on the take-up shaft, ready for use with the next film.

Planning The Picture

Plan your picture before you take it. A few minutes spent in laying out the action and sequence of scenes makes all the difference between an interesting movie that can be shown to your friends with justifiable pride, and a series of unrelated, uninteresting snapshots.

Tell your subjects beforehand exactly what you want them to do and then have them rehearse it once to make sure that no mishap will develop. Caution them against looking at the camera, or in any other way showing they are posing for you. Have them move slowly but naturally.

Length Of Scenes

Some beginners make the mistake of using too much film in taking one scene. This is both uneconomical and unnecessary, for when the film is projected, the picture becomes tiresome before the scene changes. The other extreme is also to be avoided, for cutting a scene too short also gives an undesirable effect; the scenes flash on and off the screen before the eyes of the audience can grasp the image.

For any continuous action or scene that doesn't change its nature, for instance, close-ups of people, scenics, a waterfall, etc., experience has shown that about five feet of film is sufficient. If action is changing, more than five feet may be required to tell the story. Start the camera just before the action, and stop just after the action.

Photographing Moving Objects

Following moving objects by panoraming requires special rules of its own. Swing the camera about so as to keep the subject as nearly as possible in the center of the field of view, but be sure to move smoothly and deliberately. Avoid all jerky, rapid motion, even if you must sacrifice some part of the action. If it is necessary to swing rapidly from one view to another, take your finger off the operating lever while you do so. The quick shift of scene will be blurred and not recognizable.

Whenever possible, station the camera so that the subject will move toward or away from the camera at an oblique angle so that a minimum of panoraming will get all the action. Avoid all motion at right angles to the camera—such scenes are almost always unsatisfactory. If the action must be at right angles to the camera, get at least twenty-five feet away before attempting the picture.

For Computing Exposure With A Meter

The angle of opening in the shutter is 160°. The length of exposure is approximately

for Single frame	1/32 second

(Note: It is suggested when using single frame that motor is fully wound to insure the rated shutter speed)

10 frames	1/22 second
16	1/36
24	1/54
32	1/72
40	1/90
48	1/108
64	1/144

The use of a light meter will definitely determine the correct lens opening.

Use of Exposure Guides

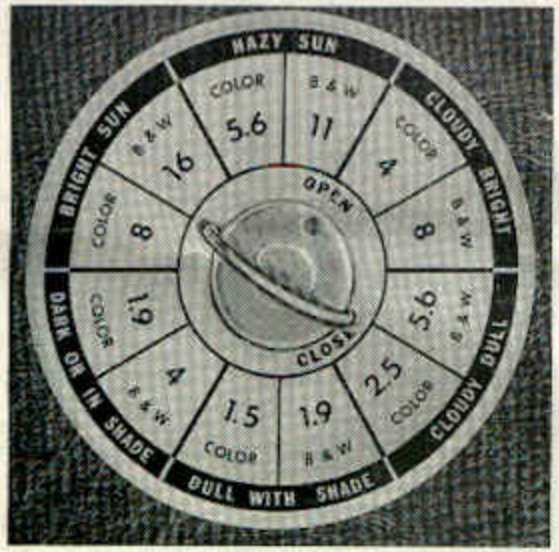


Fig. 8

To find the correct diaphragm opening of the lens ("F" setting) for Daylight Type Film refer to the Exposure Guide mounted on the camera cover (Fig. 8), to the Outdoor Exposure Guide Table on page 38 or to the Exposure Guide Card packed with your film.

For Indoor Type Film refer to the Indoor Exposure Guide Table on page 30 or to the Exposure Guide Card packed with your film.

Film

The film used in this camera can be purchased at any photographic shop. It is packed in 100 foot rolls for either colored or black and white pictures.

Kodachrome film reproduces pictures in their natural colors. The regular daylight kodachrome is used for outdoor work. When used indoors with a tungsten light a special blue filter is required to obtain the correct color. Type A Kodachrome is for use indoors with tungsten light. When used outdoors a special orange filter should be used to obtain the correct color.

The camera should be loaded and unloaded in shaded light to prevent more than a few outside rolls from becoming over exposed. Extra film is provided to protect the roll which is removed when the film is processed.

After it has been exposed remove the reel from the camera and replace it in the metal container and the inside package and mail it to the address given. It will be processed without charge and returned to you.

Do not seal the carton unless you wish to pay first class postage rates on it. The purchase price of the film also includes the cost of processing and return postage.

Uses Of F 1.9 Lens

The F 1.9 lens enables the user to take good pictures when the light is too weak for the standard F 2.5 lens. It is therefore extremely valuable if not absolutely essential, when photographing very early in the morning or very late in the afternoon, when shadows are exceptionall, heavy, or when it becomes necessary to take slow motion pictures in dull light. Its greatest usefulness, however, is in taking pictures indoors, or in artificial light.

High speed lenses such as the F 1.9 must be adjusted or "focused" for distance each time a picture is taken. Turn the knurled ring until the estimated distance in feet to the principal object reaches the index mark. All objects within several feet either side of the distance for which the lens is set will be in sharp focus.

Similarly the lens may be focused for any distance beyond 1 foot. The ∞ engraved on the knurled ring is a symbol for "infinity" and represents any distance beyond 100 feet.

The view seen through the finder for a close-up will differ slightly from the picture taken by the lens. See Page 13.

When conditions warrant using the diaphragm stops *f*5.6, *f*8, *f*11 or *f*16 the distance can be set at 25 feet and the lens will be in universal focus and can be used as follows:

F5.6-stop—from 5½ feet to infinity
F 8 -stop—from 4½ feet to infinity
F11 -stop—from 3½ feet to infinity
F16 -stop—from 2½ feet to infinity
F22 -stop—from 2 feet to infinity

Uses Of Telephoto Lens

A telephoto lens in simple, non-technical language, performs exactly the same function for the camera as a pair of field glasses does for human eyes —it magnifies the image and apparently brings it much closer. Since the degree of magnification is determined by the focal length of a telephoto lens, such lenses are always rated by their focal lengths.

The most popular telephoto lens for all-around use with 16 millimeter cameras is one having a focal length of 3 inches (75 millimeters). This provides a magnification of three times over the standard universal focus lens. The usefulness of this lens can be seen by referring to Fig. 9.

The two pictures on the left were taken from the close-up position. The two pictures on the right were taken with the camera farther away. Note in both cases how the 3″ telephoto lens magnifies the detail. Telephoto lenses must be focused for distance in exactly the same manner as F 1.9 lenses.

When using a filter on a telephoto lens, remove the hood before fitting the filter to the lens.

The use of a tripod is highly recommended for all telephoto work.

Closeups And Long Shots

You can improve the value and interest of your films by following the example set by professional movie makers. Shift the camera viewpoint from long shot to closeup, and back again, as required to carry out the continuity and action of the story you wish to tell. There is nothing so effective as a good closeup in showing up individual characteristics and mannerisms. When interspaced properly between long or semi-long shots, closeups add freshness and interest to any picture.

The four illustrations of Fig. 9 will give you some idea of the various effects that can be produced by careful selection of the camera position or through the proper use of telephoto lenses. Use these illustrations as a guide in planning your own pictures. *In taking closeups, be sure to compensate for the pictures seen in the viewfinder, as explained on page 13.*

Closeup 3" lens

Long Shot 3" lens

Closeup 1" lens

Long Shot 1" lens

Fig. 9

Use Of Wide Angle Lens

The 17 mm. focus *f*2.7 wide angle lens gives an angle of view approximately 53% wider than is obtained with a one-inch lens. This lens is recommended for use in confined spaces for obtaining a larger area.

The wide angle lens is interchangeable with the *f*2.5 lens. Merely unscrew the lens on the camera and replace it with the other lens. Be sure to screw it up tight.

The adjustment of the diaphragm of the fixed focus mount is the same as the *f*2.5. The micrometer or adjustable mount requires the same setting for distance as the *f*1.9 lens.

The view finder is designed for a one-inch lens. When using a wide angle lens we suggest centering the scene in the view finder, allowing the picture to extend beyond the edge shown in the view finder.

Use Of Portrait Attachment

Clear, sharp close-ups can be taken with a Standard attachment in front of the lens.

A 3 ft. portrait attachment is recommended for use with the various lens stops when the object is at the following distances.

Lens Stops	*f*2.5	*f*4	*f*5.6	*f*8
Min. distance	2.8 ft.	2.7 ft.	2.6 ft.	2 ft.
Max. distance	3 ft.	3.2 ft.	3.5 ft.	4 ft.

Use Of Filters For Black And White Film

Scenes which often contain a color combination that is very pleasing to the eye become pictures registered in black and white or shades of black and white when photographed. The colors lose their distinction, two different colors may appear in the picture to be just one block or shape with no difference in tone or shade, lacking any detail. Black and violet will be shown as black, green and blue will be registered as a dark grey; yellow and orange as a light grey; white appearing in its true color. Much of the value of the picture will be lost due to the lack of contrast between the colors.

With the use of the proper filters, colors which would appear in the picture as the same shade will be reproduced in different tones, changing what might be a dull monotone photograph into one full of contrast giving the picture much of its original color value.

The effects of the filter on each color must be understood before selecting the one to be used. Observe closely the colors which are to be photographed, then choose the filter which will be most effective in giving contrast to the picture. In a scene where foliage predominates a green filter is required to give contrast to the foliage. A scene of dark colors such as black, purple and dark red, requires a red filter to lighten up these colors and give sufficient contrast to the picture so that each color can be readily distinguished.

The filters most generally used to give contrast are yellow, red and green. The following table shows the shades in which each color is rendered when using panchromatic film.

For Black And White Film Only

SUBJECT COLOR	FILTER COLORS		
	GREEN	YELLOW	RED
	Shades rendered by the film		
black	black	black	black
violet	dark grey	very dark grey	black
blue	grey	dark grey	very dark grey
green	very light grey	grey	dark grey
yellow	light grey	very light grey	grey
orange	grey	light grey	light grey
red	dark grey	dark grey	very light grey

A haze filter is often used with Kodachrome film to clear up haze which very often appears when taking distance scenes or scenes in high altitudes.

A neutral density filter is used when photographing under extremely bright lighting conditions, to cut down the exposure.

The exposure required to form an image on the film depends upon the amount of light passing through the diaphragm, it is necessary to open the diaphragm enough to compensate for the light retarded by the filter. Each diaphragm stop approximately doubles the exposure. By adjusting the diaphragm the correct exposure may be obtained when using a filter with ordinary lighting conditions.

The amount of light absorbed by a filter depends upon the color being photographed and the light source. Various films have different degrees of color sensitiveness. The exposure depends upon the intensity and type of light source and the color sensitivity of the film. It is, therefore, impossible to give a filter factor which can be applied to all conditions, and any value given would only be an approximate guide.

In general one-stop larger opening may be used for 2x Filters and two stops larger opening for 4x Filters.

A yellow filter is the only one recommended for use with orthochromatic film.

The general practice is to have the filter as close to the lens as possible. Hoods which can be unscrewed from the lens should be removed and the filter screwed into place. To remove the hood grip the front end with the rubber cap on and turn counter clockwise.

A few of the uses which can be made of a filter to improve the quality of your pictures are given.

Yellow Filter

For Black and White Film Only

Penetrates haze, fog and mist.

Reduces glare from the sun on sand or water and gives better detail.

Improves detail in shaded structures, such as archways, doorways, stairs.

Gives detail in scenes where creamy or yellow tone predominates.

Red Filter

For Black and White Film Only

Cuts out blue and violet haze, fog and mist, and glare of sun on the water.

Improves detail in dark colors, purple, dark red, and deep shadows, also snow scenes, tan or shaded faces. Darkens the sky with good details of clouds and gives a lighter foreground. Over exposing will lighten the sky.

Light Yellow Green Filter

For Black and White Film Only

Improves the detail of foliage on any green scenes and reduces the halo caused by reflected green light. Darkens scenes of red, yellow and blue. Gives a dark sky.

Color Film Filter

Daylight Color Film Filter is used with daylight film and tungsten light.

Type A Color Film Filter is used with Type A film and sunlight.

Color Film Haze Filter is used to penetrate haze and light mist.

INFORMATION REQUIRED WHEN ORDERING FILTERS
REMOVE HOOD ON ALL LENSES BEFORE ATTACHING FILTERS

Lens Type	Lens Marking	Thread Size Filter
f2.5	Wollensak Raptar	23/32" dia. (.712") — 50 threads per inch
f1.9	Wollensak Raptar	31/32" dia. (.975") — 50 threads per inch
f4	Wollensak Telephoto	1 3/32" dia. (1.100") — 30 threads per inch
f2.7	Wollensak Raptar (17mm Wide Angle)	23/32" dia. (.712") — 50 threads per inch

Indoor Movies

Home Movies can be made at night with your Keystone Camera. It is only necessary to have sufficient light. This can be obtained with photo flood lamps and suitable reflectors.

Light from one source will cause heavy shadows which tend to spoil the picture. It is better to arrange the lights so that the rays come from different angles —this breaks up the shadows giving clear detail to the picture. In most scenes some light should fall in the back, or, a light colored screen may be used at the rear to brighten up the back. It should be quite close to the object.

Window shades should be drawn down to prevent reflection from the glass. All bright reflections from glass doors, picture frames or glossy surfaces should be eliminated. The lamps and stands should be so located that they will not show in the picture. Cloth or parchment shades have very little reflecting power; when used with photoflood lamps see that they are placed far enough away to withstand the excess heat given off by these lamps.

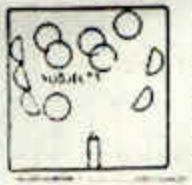
The lens stop to use depends upon the distance from the lamp to the object and not the location of the camera. See chart on Page 30.

Photoflood Lighting Suggestions

CLOSE-UP WITH BACKLIGHTING

Relatively more light is needed for close-ups, because a small lens opening should be used to get subject sharp. Refer to diagram, noting that backlight should be above or below head, and to one side. Do not count backlight in determining exposure.

LONG SHOT WITH NORMAL LIGHTING



This is an example of employing extra lamps to the side and back for the purpose of outlining all subjects with light, thereby giving greater depth to the scene. Be sure primary source contains correct numbers of lamps for distance and exposure as tables specify.

SIMPLIFIED LIGHTING

The quickest easiest lighting for acceptable indoor pictures involves merely the use of the light bar with 375 watt lamps. The table on page 30 shows the distance from the camera and light bar combination to the subject.

Indoor Exposure Guide

For Medium-Beam, Reflector-Type, 375-W Photofloods in Bar-Type Lighting Unit or No. 2 Photofloods in 12" Semi-Polished Reflectors

Lamp Beams Superimposed on Subject

Lamp to Subject Distance in Feet				Lens Openings			
Two Lamps in Reflectors		Bar-Light		Kodachrome Type A	Kodak Plus-X	Kodak Tri-X	Anscochrome Tungsten Type
Fill Lamp at Camera	Side Lamp at 45°	Two Lamps	Four Lamps				
5	3½	4½	6	f/5.6	f/8	f/16	f/8
7	5	6	9	f/4	f/5.6	f/11	f/5.6
10	7	9	13	f/2.8	f/4	f/8	f/4
14	10	13	18	f/1.9	f/2.8	f/5.6	f/2.8
20	14	18	25		f/1.9	f/4	f/1.9

For two No. 1 photofloods in 12-inch reflectors or two No. 2 reflector-type photofloods, use next larger lens stop.

Above Exposures based on camera speed of 16 frames per second and are for new lamps only. After lamps burn 1 hour use ½ stop larger opening; after 2 hours use 1 stop larger opening.

Above exposures are for average subjects. For dark subjects use ½ stop larger opening; for light subject use ½ stop smaller opening.

Titles

You can have your film titled by your movie camera dealer for a small cost or you can purchase a titling outfit and do this work yourself. Titling adds continuity and interest to the picture and makes the sudden change from one scene to another less abrupt.

Splicing

General practice is to splice eight 50-ft. lengths of 16mm. film together making one 400-ft. reel, which Keystone projectors are equipped to carry. You can purchase a Keystone splicer from your dealer, either the K-161 Projector with its built-in splicer or the D-18 splicer.

A 200-ft. reel of 8mm. film is equivalent to 400 ft. of 16mm. or 1,000 ft. of 35mm., the film used in the movie theatres.

Lubrication

Your Keystone Camera does not require any lubrication under normal usage. It has been lubricated for life at the factory.

Indoor Exposure Guide

For Medium-Beam, Reflector-Type, 375-W Photofloods in Bar-Type Lighting Unit or No. 2 Photofloods in 12″ Semi-Polished Reflectors

Lamp Beams Superimposed on Subject

Lamp to Subject Distance in Feet				Lens Openings			
Two Lamps in Reflectors		Bar-Light					
Fill Lamp at Camera	Side Lamp at 45°	Two Lamps	Four Lamps	Kodachrome Type A	Kodak Plus-X	Kodak Tri-X	Anscochrome Tungsten Type
5	3½	4½	6	*f*/5.6	*f*/8	*f*/16	*f*/8
7	5	6	9	*f*/4	*f*/5.6	*f*/11	*f*/5.6
10	7	9	13	*f*/2.8	*f*/4	*f*/8	*f*/4
14	10	13	18	*f*/1.9	*f*/2.8	*f*/5.6	*f*/2.8
20	14	18	25		*f*/1.9	*f*/4	*f*/1.9

For two No. 1 photofloods in 12-inch reflectors or two No. 2 reflector-type photofloods, use next larger lens stop.

Above Exposures based on camera speed of 16 frames per second and are for new lamps only. After lamps burn 1 hour use ½ stop larger opening; after 2 hours use 1 stop larger opening.

Above exposures are for average subjects. For dark subjects use ½ stop larger opening; for light subject use ½ stop smaller opening.

Care Of The Camera

When not in use the Camera should be kept in a Keystone Carrying Case which is designed to protect your Camera from dust and dirt.

The lens should be cleaned whenever necessary. A dirty lens causes cloudy pictures which lack brilliance and sharp focus on the screen. Wind some sort of lintless cloth around a match stick and rub the front of the lens gently, taking care that you do not scratch it by too much pressure. Do not moisten the cloth in any way. Occasional cleaning of outer surface of front and rear lenses of the view finder will insure clear vision at all times.

The lens should never be taken apart for any reason.

The pressure plate and aperture plate should be regularly cleaned after each roll or two of film. Dirt or small pieces of emulsion sticking to the aperture plate will cause the film to become scratched and create a rain-effect on the screen. To clean the pressure plate and the aperture plate, take a small strip of chamois or similar material about the same width as a piece of film and slide it into the film gate as though it were film. Then draw it back and forth two or three times to remove any foreign particles that might be there.

When the camera is empty and not in use, avoid unnecessary tension on the spring by letting the motor run down.

Suggestions For Better Pictures

Poor results are generally due to the following causes, for which we suggest possible corrections. Plan the scene before taking the picture, select a suitable background and see that the lighting is fairly uniform.

FILM LIGHT STRUCK appears as light flashes on the film, CAUSED by rays of sun light striking the film. CORRECTION, do not allow direct light to fall on the film when loading the camera, see that the cover of the camera fits tight and that the lens is not pointed toward the sun when taking the picture.

If reel plates are even slightly bent, light will enter between side of disks and film, causing film to become light struck along the edge.

CAMERA JAMMED CAUSED by film not winding up on the take-up reel, and piling up inside the case. CORRECTION, check the empty reel before using, see that the flanges are not bent and that the space between the flanges is wide enough for the film to enter. Also, make sure film is properly attached to hub of reel.

UNDER EXPOSED pictures are too dark and the shadows lack details. This is CAUSED by insufficient light falling on film. CORRECTION:—The lens opening recommended on the exposure guide should

be used, a smaller opening gives underexposure. The lens cap must be off when the exposure is made.

OVER EXPOSED pictures are too light and the highlights lack details. This is CAUSED by too much light falling on the film. CORRECTION:—The lens opening recommended on the exposure guide should be used, a larger opening gives over exposure. The spring motor must not be allowed to run down completely when exposure is being made.

UNSTEADY OR TILTED pictures are not pleasing to look at. They are CAUSED by the camera not being held steady and level when the picture is taken. CORRECTION:—Hold the camera firm and steady, stand still, and check the image in the view finder to see that the camera is level.

OUT OF FOCUS pictures are blurred and not sharp. This is CAUSED by the lens not being properly fitted or set. CORRECTION:—The lens should be screwed in tight, focusing lens must be set to the correct distance from the object. Universal lens should not be used at distances closer than those recommended for various diaphragm openings—and distant shots with Universal Focus Lenses—will not be sharp with openings larger than F 8. Panoraming is not recommended and should only be done by one thoroughly experienced in using a camera.

FILM SCRATCHES are perpendicular lines running through the picture, CAUSED by an accumula-

tion of emulsion or dirt in the film gate. CORRECTION:—Clean the film gate before threading a new roll of film. Projector film gate should also be cleaned before running film through it.

LOSS OF LOOP results in a double image or badly blurred picture. This is CAUSED by the film being pulled through continuously by the sprocket rather than fed through intermittently by the feed finger. CORRECTION:—Film should be properly fitted over the sprocket teeth, inserted correctly in the film gate after the upper and lower loop is formed, and checked to see that the finger engages and moves the film, before putting on the cover.

KEYSTONE CARRYING CASE

This Carrying Case can be used for the A-9 Keystone Camera. It is fabricated of genuine leather. Equipped with straps that are adjustable, the case can be carried either in the hand or on the shoulder.

Approximate Size Of Field Obtained With A KEYSTONE CAMERA 16-M.M.—Using 1″ Focus Lens

Distance from Camera in Feet	SIZE OF VIEW	
	VERTICAL Angle 16°-9′	HORIZONTAL Angle 21°-22′
2 feet with focusing mount or with portrait attachment on fixed focus mount.	0′7″	0′9″
3 feet with focusing mount or with portrait attachment on fixed focus mount.	0′9″	1′0″
4 Feet	1′2″	1′7″
6 Feet	1′8″	2′4″
8 Feet	2′4″	3′1″
15 Feet	4′4″	5′11″
25 Feet	7′2″	9′8″
50 Feet	14′6″	19′6″
75 Feet	21′8″	29′4″
100 Feet	28′11″	39′1″
200 Feet	57′11″	78′2″
500 Feet	144′10″	195′7″

Exposure Indexes for 16MM Movie Film

	FILM TYPE	ASA EXPOSURE INDEX	
		DAYLIGHT	TUNGSTEN
KODAK	Kodachrome, Daylight Type	10	5*
	Kodachrome, Type A	10**	16
	Plus-X	50	40
	Tri-X	200	160
ANSCO	Anscochrome, Daylight Type	32	8†
	Anscochrome, Tungsten Type	25‡	32

*With Kodak Photoflood Filter No. 80B; with No. 80A, use index of 2.5.
**With Kodak Daylight Filter No. 85.
†With Ansco Photoflood Filter No. 10.
‡With Ansco Daylight Filter No. 11 or No. 85A.

Daylight Exposure Guide

FROM 2 HOURS AFTER SUNRISE TO 2 HOURS BEFORE SUNSET

Sky or Light Conditions	Kodachrome Daylight Type*	Kodak Plus-X	Kodak Tri-X		Anscochrome* Daylight Type
			With Kodak ND-3 Filter	Without Filter	
Bright Sun on Light Sand or Snow	*f*/11	*f*/22	*f*/16	-	*f*/16
Bright Sun - Clear Sky	*f*/8	*f*/16	*f*/11	-	*f*/11 - *f*/16
Subject Front Lighted	*f*/5.6 - *f*/8	*f*/11	*f*/8	-	*f*/11
Side, or Back Lighted	*f*/5.6	*f*/11	*f*/8	-	*f*/8 - *f*/11
Back Lighted, Close-Ups					
Hazy Sun - Soft Shadows	*f*/5.6	*f*/11	*f*/8	*f*/22	*f*/8 - *f*/11
Cloudy - Bright	*f*/4	*f*/8	*f*/5.6	*f*/16	*f*/5.6
Cloudy - Dull, or Open Shade (Wide Blue Sky Overhead)	*f*/2.8	*f*/5.6	*f*/4	*f*/11	*f*/4
Dull with Shade	*f*/1.9	*f*/4	*f*/2.8	*f*/8	*f*/2.8

Above exposures based on camera speed of 16 frames per second.

***Exposures are for average subjects. For dark subjects use ½ stop larger opening; for light subjects use ½ stop smaller opening.**

For further information refer to the pamphlet packed with your film.